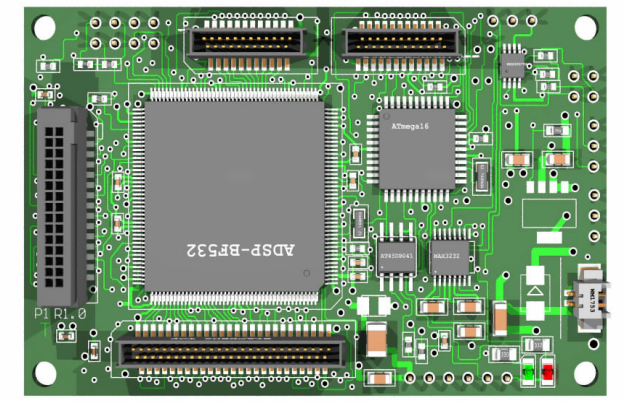
P1 PIRANA SMART EMBEDDED VIDEO PROCESSOR
PRELIMINARY PRODUCT SPECIFICATION

SOC MACHINES

Features:

- Blackfin ADSP-BF532 300MHz DSP Processor
- AVR Atmega16 8MHz Supervisor Processor
- 32Mbytes SDRAM
- 512Kbytes Flash (1,2,4M optional)
- 2 RS-232 Ports, RS-485 Port
- 8Ch 10 bit A/D
- General Purpose Video Input Port
- 7 Bi-directional I/O ports
- Blackfin Memory/SPORT Expansion Port
- AVR Analog/Digital Expansion Port
- Blackfin JTAG/AVR ISP Programming Ports
- Extensive Source code examples
- GNU C compilers for both processors
- 5-7VDC input, 3.3V on board @10-450ma
- Small form factor (2.9x1.9in)



Pirana 1 (Actual size: 2.95x1.90 in)

Overview

The P1 is a dual processor high performance embedded video processing and general-purpose controller engine. About the size of a business card the P1 has a 400MHz Blackfin DSP processor with Dynamic Power Management and an 8MHz self clocked AVR ATmega16(32) 8bit RISC processor for general IO and Blackfin management. The Blackfin memory consists of 16Mx16 of 133MHz SDRAM and a 512Kx8 Flash. The Flash can be increased to 4Mx8. The AVR processor contains 16K bytes of internal Flash, 2K of SRAM and 1K of EEPROM. Dynamic power management allows both processors to enter a deep sleep state dropping power to the mA range. Dual real time clocks provide continuous time of day tracking. A general-purpose video port supports a variety of camera modules from NTSC to 3Mpixel. The AVR provides 8 10bit A/D channels, 8 digital IO lines. The P1 has 2 RS-232 ports, an RS-485 port, SPI port, dual SPORTS and a 2 Wire serial bus. The 2 Wire serial bus provides seamless attachment of additional AVR data acquisition processors.

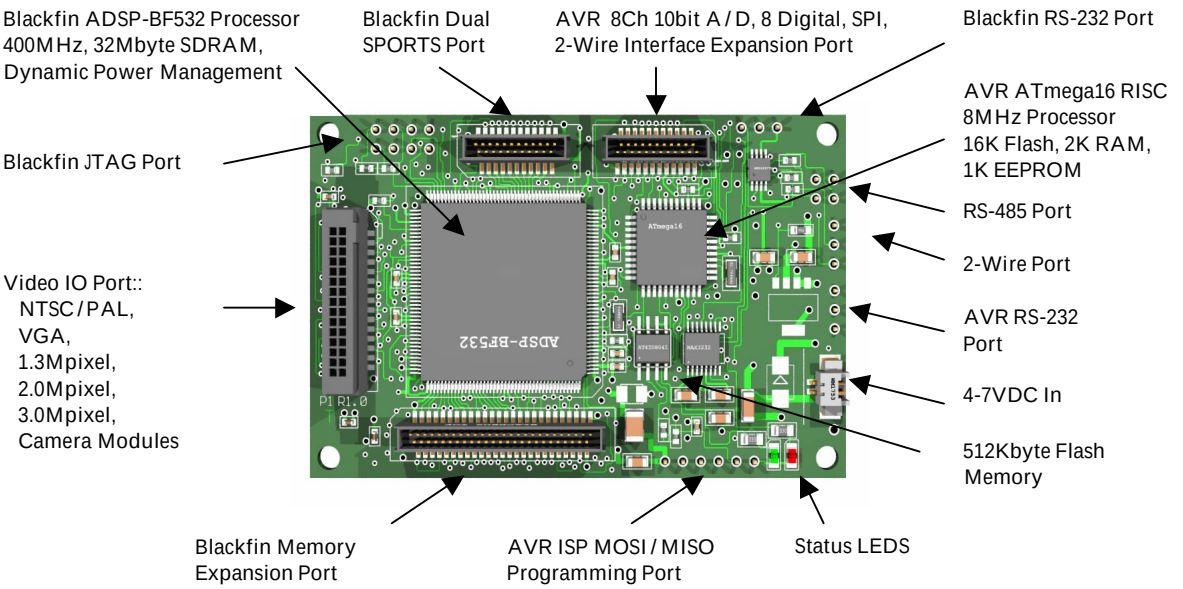
Hardware – Blackfin/AVR

The P1 is a dual processor board with a 300MHz Blackfin processor and a 8MHz ATmega16 processor. The Blackfin is a high performance 16 bit RISC DSP with dual MACs, multiple accumulators with 84Kbytes of internal program and data cache. The Blackfin is capable of 600MMACs and is designed for ultra fast image processing and general purpose processing. Programs are loaded from a 512Kx8 Flash and execute from the 16Mx16 SDRAM. The SDRAM provides both program and data storage. The video expansion port accepts several color and BW camera modules or can be used as a general-purpose data port. A memory expansion bus supports additional peripheral daughter boards. The Blackfin ultra high-speed serial ports (SPORTS) are available on another expansion port. A Blackfin JTAG emulation port and RS-232 serial port allows local communication. A real time clock provides self timed sleep capability with several power down modes. The Blackfin communicates with the AVR using an SPI port.

The AVR processor is an 8MHz self clocked general purpose controller with 8 10bit A/D channels, 7 general purpose bi-directional digital IO channels, an RS-232 port, RS-485 port and 2-Wire port. The AVR processor has 16Kbytes of Flash, 2K SRAM and 1K EEPROM. The 2-Wire port is a general purpose communications bus that connects multiple AVR satellite processors each supporting remote wake-up, node ID identification and high-speed data transfer (>400Kbits/sec). The AVR communicates with the Blackfin and 512K Flash over a high speed SPI link. The AVR controls the Blackfin reset line and provides initial boot code to the Blackfin after reset is released. Alternatively the Blackfin can boot from Flash. A real time clock allows the AVR to enter a deep sleep, ultra low power state with clock or external event wake-up.

Software Tools

The P1 Hardware Development Kit comes with a complete set of open source boot, debug and control software plus a comprehensive set of image procession application programs. Windows and Linux GNU C compilers are available for both processors. The AVR is programmed using a low cost ISP adapter. Blackfin emulation is supported via a JTAG port. A monitor program in the AVR loads a small boot program into the Blackfin that then loads code from either Flash memory, Blackfin serial port or AVR serial port. Optionally, the Blackfin boots directly from Flash memory. The AVR controls the Blackfin boot mode. The Hardware Development Kit includes everything you need to get started.



Software Tools (continued)

A comprehensive set of software library functions is provided to control access to all board resources. Included are image format conversion routines and video capture control functions. Video library functions include Video Decoder setup and control, SDRAM buffer management, Video format conversion to from YUV/RGB. The P1 also runs uCLinux.

Daughter Cards

The P1 is compatible with a family of interface daughter cards. A 10/100BaseT Ethernet interface provides complete communication flexibility with IP based networks. An Ethernet/FPGA card provides both IP connectivity and specialized algorithm storage for JPEG2000, Motion JPEG2000 and MPEG applications. Several Video Camera modules ensure a broad selection of image resolution options for most applications from NTSC to 3Mpixel.

Hardware Development Kit

The P1 is available as a bare board or as a Hardware Development Kit (HDK). The HDK includes everything you need to start development. Included is the P1 Development Platform, ISP cable, 10/100 Ethernet card and NTSC video card.

Technical Specifications

Electrical

Input voltage: 4-7VDC @ 20-180ma

Board voltage: 3.3VDC @ 10-250ma (sleep mode)

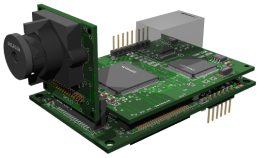
Mechanical

Dimensions: 2.95 x 1.90 in

Weight: 100 grams

Additional Options

The P1 options include a number of interface modules including Digital Camera Modules, 10/100 Ethernet, Color TFT Interface and FPGA.



Ordering Information

The P1 is available as a bare board or as a Hardware Development Kit (HDK). Several daughter cards are available for expansion flexibility.

P1	Pirana 1 Dual Processor Board
P1-HDK	Pirana 1 Hardware Development Kit
CM64	NTSC/PAL Analog Video Module
CM100C	Digital Color VGA Camera Module
CM200-13	1.3Mpixel Camera Module
CM200-20	2.0Mpixel Camera Module
CM200-30	3.0Mpixel Camera Module
APS12	10/100 Ethernet Module
APS24	10/100 Ethernet/FPGA Module
CQ400	Quad Channel Video Module
PLC320	Color TFT 320x160 Display Adapter
P1-DP	P1 Development Platform
ISP10	ISP Programming Adapter
JT10	JTAG Programming Adapter

You may order directly from SOC Machines by placing an order on the web site: www.soc-machines.com or by calling (604) 985-9837 or by contacting one of our sales representatives or distributors.